

May 08, 2019

# Case Study

## Modbus TCP to HTTP

Bringing automation to inventory management

To keep the customer anonymous, we replaced their name with “ABC Company”.

### OVERVIEW

ABC Company’s site consists of multiple industrial motors, called drives, that are used to bend wire into hangers. Currently they use a system called File Maker to manually input inventory and job details. Information such as job started, stopped, maintenance required, wire required, and others are all manually written on log sheets before being inserted into the main File Maker database. The current process is slow, not in real-time, and allows for mistakes to occur in the data entry. There are also two site locations, and for the remote site the data needs to be sent to their main site for data logging.

The company is currently updating all their drives which will allow them to have all the data points available as Modbus TCP data points. We have been asked to help the customer integrate the Modbus TCP data automatically from the drives and send it directly to the File Maker system using HTTP requests in real time.

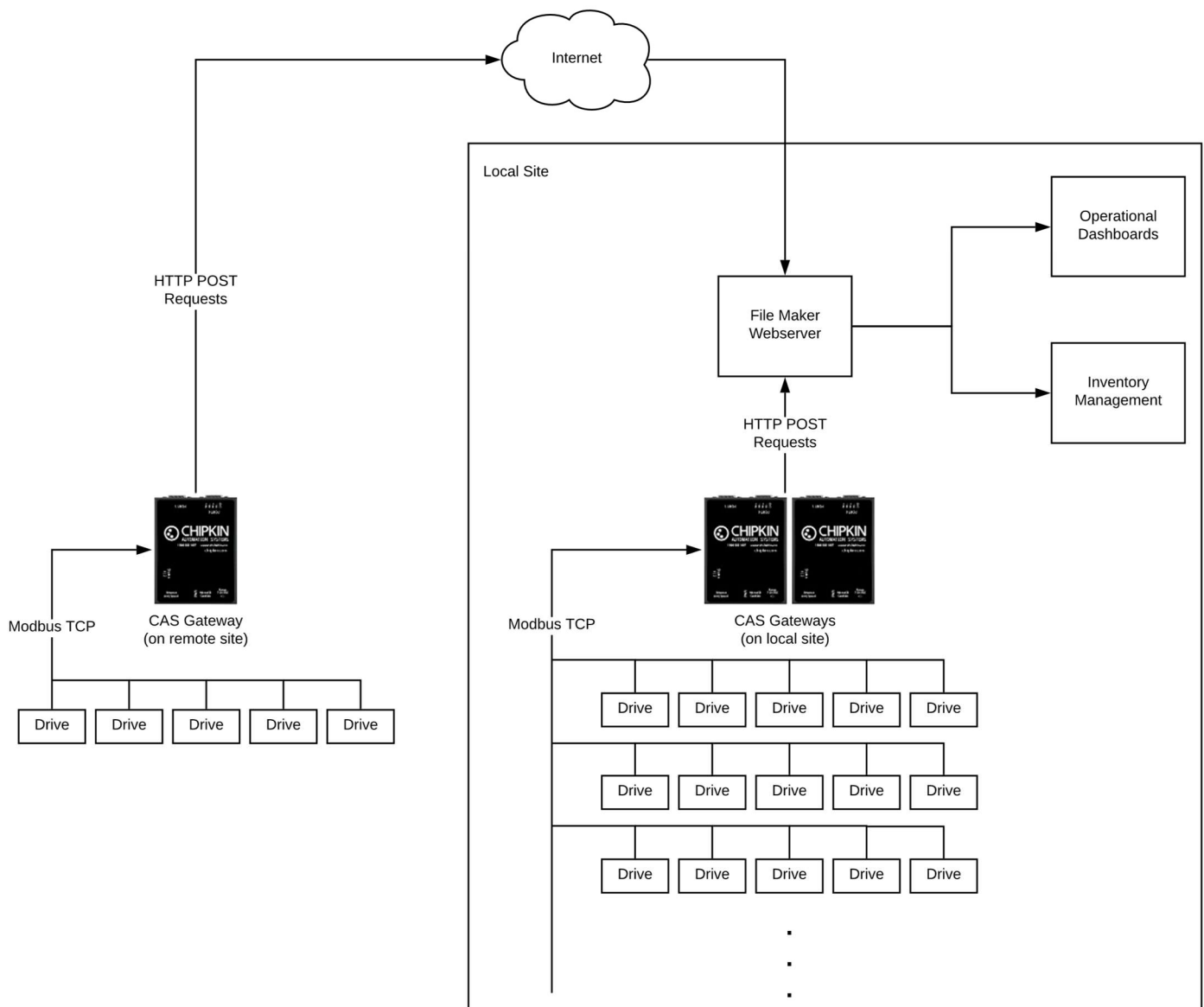
### ABC COMPANY NEEDS / REQUIREMENTS

- A custom Modbus TCP driver to get data from the drives and push various state data and inventory information to File Maker
- Stable hardware and/or software to be installed on both the local and remote site to gather, store, and transmit the data
- Needs to be scalable and efficient

## SOLUTION

Our solution for the customer is to install multiple gateways that contain the custom Modbus TCP drivers to poll the values from a subset of the drives on the network. One other gateway will be installed in the remote location to poll from the various drives found there. All of the gateways will be configured to send HTTP requests containing the required data to the central File Maker server in the main local site.

Looking at the figure below, we offer to install our CAS Gateway on the site's local network and their remote network, where they will collect the data, run logic on it, and sends the data and commands to the File Maker webserver.



## HOW IT WORKS

The CAS Gateways are installed on both the remote and local site's local area networks on the same network as both the drives and the File Maker web server. The drives are operated by a Touch Screen panel that also acts as a Modbus TCP server device. The Touch Screen allows users to input various commands that change the state of different Modbus registers. The CAS Gateway reads these

registers and depending on the values, runs a series of different states that cause the CAS Gateway to read additional values as the user inputs them and ultimately results in the CAS Gateway sending a HTTP POST request to the File Maker webserver.

An example of this is a user that is starting a new job. The user presses the Start Production button, which sets a value in the Modbus register. This value when read by the CAS Gateway causes the CAS Gateway to go into the Start Production state and reads other registers as the user inputs the required Start Production data. Once all the data has been input, the CAS Gateway packages the required information into a JSON payload that is then sent to the File Maker's Start Production URL.

Operations include Start / End Production, Change Wire, Start / End Maintenance, Request Help, Request Wire.

File Maker (not supplied by Chipkin) then is responsible for creating the relevant inventory updates as well as the local dashboard for the current status of all the drives.

## OUTCOME AND CHALLENGES

Chipkin was able to successfully implement the solution on spec, but during initial testing we discovered that the processing power of the CAS Gateway devices were not capable of keeping up with the polling speeds required to service all the drives on site. After testing, we determined that one hardware device was capable of handling ten drives. Therefore, we altered the solution by providing one hardware CAS Gateway for the remote site, and two hardware and one software CAS Gateway for the local site.

With the CAS Gateways installed, the customer was able to automate their data entry, decrease data entry errors, and receive their data in close to real-time.